

An Original Essay on the
causes, diagnostics and cure of Bilious
Colic. submitted to the examina-
tion of the Medical Professors of the
University of Pennsylvania

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Nothing additum, minus in ver-
magister. House.

1800 - No 2 -

The subject I have chosen for
my Inaugural Essay is Biliary Concretions.
The obscurity in which it is enveloped
will, no doubt, induce many to conclude;
that I have been too sanguine in attempt-
ing to treat on a subject so intricate; and
one that has baffled the most celebrated
physicians and physiologists to unravel.

But, its great importance to the physician
in a practical point of view will be a ample
apology for the attempt. — If I should
have the good fortune to throw a little
light on it, the praise will be the greater.
If not, I can offer the same plea that many
others have done, "the extreme difficulty of
the subject."

The Liver is the largest glandular viscous
in the human body. Passing by the
other numerous functions that have been
ascribed to it, I shall confine myself
to that very important one, the secretion
of the bile; — its properties; — the actions
of different agents on it, and its conse-
quent parts.



There is none of the secreted fluids that has engaged so much of the attention of Chemists and Physiologists as the bile, both on account of its importance in the economical economy as well as the various and complicated diseases which a change of it either in quantity, quality or consistency produces.

Newly bile when first secreted is a mild bland fluid, without much taste, colour or odour: but as it is an established law, that in proportion as efforts proceed from their causes, they lose their identity, so the bile becomes more bitter, viscid and more cohering and of a darker colour, as it progresses towards the excretory ducts, and it is detained in them, or in the gall bladder.

The bile is found by analysis to contain water, soda, - a species of vitellin acid united to the soda - some albuminous substance, phosphate of soda discovered by Redi, and some acetate, while others deny the existence of iron in the bile.

Nothing further need be said to prove the existence of water than that it is the solvent of all its materials and that the consistency, taste, and colour of the bile are much influenced by it.

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The alkaline or saponaceous property of the bile is clearly shown by these facts.
 1st. It turns tincture of violet green & it renders oils miscible with water: it is for this greatly that it is so much sought for, and used by Stillers in removing the sloughs and taking out greasy stumps. In these cases the alkali of the bile unites with the oil or grease and forms a soap which is soluble in water.

2^d. to determine which of the alkalies was contained in the bile: I instituted the following experiments.

1st On two ounces of beef gall, I poured two drams of sulphuric acid: a slight effervescence took place, with a disengagement of gas.

To this, I added two ounces of water and stirring up the mass, I placed it in a soap-plate on a stove to evaporate: at the end of three days the residue was covered with ^{with} crystals of Glauber salts.

2. I poured on one ounce of calf bile one ounce of nitric acid: the bile did not soagulate as I expected it would; but its colour was instantaneously changed to a white. There was some effervescence. I put the whole into a flask and applied the heat of a lamp; till the fluid parts were dissipated. I let it stand undisturbed for twenty four hours when the

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oil when was acted with small crystals which
had a sharp and cool taste and resembled
nitre.

3 On this residuum I poured some more
acetic acid, a violent effervescence ensued
with a quantity of a dark yellow colour-
ed gas: and the sharp and pungent
taste of the residuum was converted
into a saline taste. These experiments
prove that the alkali is soda. — Since I made
the above experiments I found that the resi-
dum of soda was also proven by Cade's.

These arguments that were adduced in sup-
port of the supranatural properties will
suffice to prove the existence of oil also
in the bile. As to form a soap, an oil
must be united to an alkali.

The Albumen is seen by the curds found
in the bile. It is coagulated by the acids.
Cade's obtained albumen from it by
means of the sulphuric acid. The
Alkalies diminish the viscosity of the bile and
render it more fluid. Salts, Strontian
and Lime combine with the oil and form
an insoluble earthy salt. Acids both
vegetable and mineral at first coagulate,
but afterwards, on the quantity of acid being
increased, decompose the bile. — and
by combining with the soda, the oil can be

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albumen are precipitated.

Samuel informs us that the colour of the bile is destroyed by the oxygenated muriatic acid, and that the albumen is separated by it, while the biliary soap is still in solution but that, on adding more acid, the oil will be separated in a white concrete form, which he conceived to be the crystalline matter of biliary calculi.

It is a well known fact that all the secretions are made from the blood and that too from the purest or arterial blood with the exception of the bile only. — I therefore presume that no person will hesitate to grant that as the blood furnishes all the materials of the different secretions so these must be affected by any change that takes place in this blood. It will perhaps be said that the different properties and qualities of milk and urine, saliva and semen depend more on a peculiar action of their respective secreting organs than on the blood. — But this must very depend on the peculiar action of the glands yet I maintain that the blood is a chymous fluid and if any of its component parts, the soda for instance, be deficient in quantity the albumen will be in excess and insoluble in the serum.

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For the reason is the hard of union, being
the serum and albumen and renders the
latter soluble in the former. Thus the
insoluble albumen will be deposited
in all parts of the body but particularly
in the secretory organs where it is left
in greater escape after the secreted fluids.
Hence we find Calculi in the Kidneys, bladder,
duo, pancreas, spleen, intestines and liver.
They have sometimes been found in the heart
and brain and nothing more common
than to find them in the joints of joint
people. They have also been found in the
intestines.

All parties agree that the chyle is the probative
note and that no change can take place in
the blood as long as this is supplied in suffi-
cient quantity to nourish the system.
But when the stomach weakened by intemper-
ance, scruffs, or any other cause as to be
unable to secrete gastric juice sufficient to
convert the food into chyme previous to its
descent into the duodenum, it will not there
be converted into chyle.

For James, Coomans, Spallanzoni agree that
if the food be not changed in the stomach
to a putrescent mass, acrid and putrid
fermentation will ensue, which are followed
by acid eructations, acidities, eructations
flatulency &c. and that the action of the liver
and pancreas juice will not be able to pro-

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high from the undigested mass.
This is further substantiated by the experi-
ments of D. J. Fordyce. He tied the ducts
common to a dog to prevent the flow of
bile into the duodenum, yet digestion
went on undisturbed, and no stones formed.
These experiments prove that affections of the
stomach are the cause of concretions and
not the effect, as many suppose. On a day of
sea with its train of ills, by a hand
was rather by some considered as the ef-
fect of a diseased liver are truly causes
of it.

There appears to be an intimate
connection between biliary calculi and those
found in other parts of the body. Rustmann
was found in the body of Frederic III. Clitor of
Germany a large stone in the Gall bladder,
another large one in the Vesicae urinariae
and a third in the kidneys. Rustmann
found 22 calculi of various sizes in the gall
bladder and 13 pretty large in the bladder.
Hoffmann found calculi in the kidneys and
in the gall and urinary bladder of the
same person. This shows a calculous
diathesis in the blood arising from an im-
proved state of it.

If it be granted that an excess of acid generated
in the system, by indigestion or the
abuse of ardent spirits, be the primary
cause of all concretions by combining with
the soda of the venous of the blood as

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as mentioned above with haemul-
more certainly must this arise be the cause
of gall stones since they are formed from
the bile which is secreted from a blood
different from any other in the body both
as to the nature of its circulation, the
slowness of its motion and its thick-
ness. — Besides it is generally believed by the
ablest physiologists of the present day that
the constituents of the bile are contained
in the blood of the Vena porta and are in
part derived from the hepatic vessels.
This at least agrees with the appearance
of probability from the large size of the liver
in the fishes and in other animals of pe-
lagic respiration and also from the
excrementitious nature of the bile. Thus
the alkaline part of the blood of the Vena
porta will be more neutralised than that
of the whole system. Hence a diminished
secretion of bile and the formation of gall
stones. A sedentary life, intense study, too
liberal use of spirituous liquors and pas-
sions of the mind are all enumerated
by writers as causes of biliary calculi.
They are so. But it is these the medium of the
stomach by debilitating and weakening its
tone and thus producing acetous fermenta-
tion and generating acids throughout the sys-
tem. From a diminution of the alkali the earth
(and congealable oil are left behind in the

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from which they are propelled into the ducts and gall bladder where from the absorption of the thinner parts, they become hard, and of considerable size from the accumulation of the same. Farner has given the name of adipose to these tubercles composed chiefly of the oil. They are of an irregular solid mass, - of a whitish colour inclining to yellow: they are very combustible and soluble in the nitric and nitrous acids and in spirits of turpentine, but do not combine to require 1 1/2 of S. to fuse them.

These tubercles which consist principally of the albumen as the phosphate of lime ^{and} are so compact as the former: they are of a reddish colour inclining to ~~white~~, their surface is smooth and when broken, they are of concentric laminae on the outside and of a radiated texture in the centre. — They are soluble in the acid of the body in the above mentioned acids at the common temperature: but in the sulphuric acid, and in spirits of turpentine and alcohol require the help of a sand bath.

But are frequently of various colours and properties from the same person and differ from each other both in their external and internal structure. I have seen some tubercles whose nucleus was composed of oil & the remainder phosphate of lime and vice versa. These compound tubercles are insoluble in the Nitric, nitrous acids and

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in spirits of wine and turpentine. They form many varieties in shape and appearance; which depend on the length of time they are retained on the ducts and gall bladder as from attrition against each other I should for think it needless to enumerate all the varieties mentioned by Ferrius, Willius and thus as they all admit of the same method of cure.

Columbus, Vesalius and Comenius make mention of calculi found by them in the Vena porta. These calculi could not be driven in back against the flow of the bile and blood of the Vena porta. It is actually impossible. It therefore shows that the blood of the porta is changed with these principles that form bile and calculi.

The number of calculi found in the gall bladder and ducts are various. Blenniorrhoea the cause of our old Lady in whose gall bladder are 300 calculi were found: six of which were as large as nutmegs. — Hoffman says he found 3646 calculi in the gall bladder. Dr. Keast informs us he has seen many patients void some hundreds of calculi and a Patient of Dr. Cass discharged 70 during the operation of a sponge. — The size are also various from that of a millet seed to an walnut. The smaller the calculi the better the large ones prevent the escape of the small by stopping up the ducts. A number of small calculi are sometimes

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found united forming a large one. In the *Gonion* of *Phimacrus* *micranis* is inside of a stone composed of 132 small ones. In the *Actin* *Physica* *Droica* there is an account of a calculus weighing two ounces which broke into 60 small stones.

Symptoms. When a stone is passing thro the ducts, and it meets with much resistance either from its size or compaction small thro of the ducts; the patient is seized with a very acute pain in the right hypochondrium; a sense of weight at the pit of the stomach, sickness arising from the sympathy of the stomach with the distended duct; a high symptomatic fever with a frequent, full and hard pulse, which fever has been known to terminate, when not prevented by copious bleeding and other depletion remedies; in a suppression of the urine; but often in the death of the patient. If the paroxysm should continue for 24-36 hours with more and then a slight remission the urine becomes diminished in quantity and so very yellow as to stain the linen; and the sediment is tinged with a yellow cast and the skin of a saffron colour, attended with obstinate constipation and the whole region of the abdomen swells. All these alarming symptoms disappear when the gall-stone has passed into the intestines and in a short time the patient has a stool of whitish colour at first; but afterwards

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of a black colour and quite loss.

The patient in a short time recovers his usual strength and imagines himself perfectly cured. But he finds himself deceived. The short respite he enjoys from his former was delusion. He is again seized with the paroxysm perhaps more severe than the former, for the length of the fit and violence of the pain depend on resistance the calculus meets with. The patient is often convulsed from the severity of the pain, and is often vomited from it, so much so that fainting fits come on attended with a cold clammy sweat, great prostration of strength with a frequent weak and irregular pulse. Signs and an Hippocratic countenance indicate the near approach of Death unless relief be speedily afforded and the calculus discharged into the duodenum.

These symptoms do not occur precisely alike in all persons; they vary even in the same person at different times. This variety in the symptoms may arise from various causes according to the size and shape of the calculus and the habits of the patient. But the symptoms of Calculus in the gall-bladder is still more uncertain and obscure. — The Calculi have been found in the Gall-bladder appended to

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of which there had been no signs while
living. But generally the patient is attended
attacked with severe ^{intermittent} pain, and he himself
and his physician call a fit of the colic
this means as often as a calculus enters the
ducts and continues till it passes into the
intestines. In other instances there is constant
and pain without any eruptions. Hildanus
describes mentions the case of a woman who
endured such pain for thirty years that
she imagined she had a viper within
her. — On examining her after death
nothing was found that could give rise
to such constant pain, but a very large
stone in the gall bladder. —
Forstner quotes the case of a man who suf-
fered very violent and constant pain for
a year or more the cause of which was
found to be a large stone in the gall
bladder which so compressed the colon
as to wear partly thro its coats while
those of the gall bladder had remained
of integrity. — But the following symptoms
are the most constant. General asthenia
a deficient secretion of bile, emaciation
a pale swarthy countenance with a yellow
scent and languid eyes, a sense of weight
at the stomach. — The patient does not
walk erect, but either stoops or inclines
to one side or the other. — sleep very

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much disturbed and interrupted by disagreeable dreams; a difficulty of breathing and febrile perspiration. In the most part a craving and voracious appetite with a small languid pulse but often preternaturally slow with cold extremities a bitter taste in the mouth on waking with mucus and then a clamor, and pain in the right arm extending up to the shoulder and occasionally a want of pulse. &c.

The Indications of cure are

1st. To equalize caloric when formed.

2dly. To prevent their bad effects on the system.

3^d To destroy the calculus diathesis.

When from the irritation of the gallstone there is a high inflammatory fever, and action must be had recourse to without delay. It not only prevents the formation of an abscess in the liver, but when done in considerable quantity also forms the discharge of the calculus by removing the tension and stricture from the ducts and inducing relaxation in them. — Caution. These should not be used when there is much fever present or a determination of blood to the head. In general large doses are required in subacute and intermitting complaints. — The Indications

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given in such doses as after exciting
nervous for can have a more, with both
sweat and purge, has the best effect.
For a number of colic have been
cured by the purgative quality of the
water thus administered. The sul-
phate of copper, as it produces a greater
degree of nervous, is also very useful in
this way, and either preferable to full
and quick purging.

Cathartics. These are useful in discharging
the hardened feces that clog up the intes-
tines and restrain and they with the
purgative action of the Extremities
by their stimulus. They have brought
away large numbers of Colic. The most
drastic should be preferred. Dr. Ferri-
nolates that an hundred cathartics are
discharged by the first purge, and many
more by the second course should.

Dr. Ferri-
nolates tells us that a Lady voided
a cathartic larger than ~~the~~ a cathartic by
one drastic purge. But the milder kind
as Manna, Gummi, Castor oil, Colomel and
Rhubarb together with the soap pill and
Mucilaginous waters have all been attended.
Dr. Ferri-
nolates recommends senna water very highly.
Dr. Ferri-
nolates's portulac moved her health
while using it. These remedies are adapted
for such cases only as are attended with

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with fever and a plethoric state of the system. But cases more frequently occur without fever, a imminent critical action: in such cases the treatment I have mentioned would be not only improper, but very injurious. Here the Clafs Imitation must consist, as Electricity. I have seen manifest benefit from the use of this in the direction of the acuta. Another, Ferriery says that a thin mist of the white of an egg is very useful in allaying the spasm occasioned by cal-culi, at the same time that it dissolves them. Dr Darwin recommends other combinations with the yolk of an egg. The Vitric acid has lately been highly recommended. If it does good, it must be by its strong soluting property and not by falseng. I prepared Vitric acid on five calculi taken from different subjects and it only changed the colour and made them a little softer — even if this or any other acid would dissolve them out of the body, that after going the rest of the circulation, the small portion which would arrive at the liver would possess its former strength and dissolve the calculus. ^{very improvable} ~~Opinion~~. A patient of Dr. Putson's voided a very large calculus by means of hard warm bath with gentle laxatives of Cal. Ricini. The patient took 360 drops for three

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days after the discharge of the stone, we
recovered perfectly. — During I follow
served twelve out of thirteen patients labor-
ing under biliary concretions by exciting a
relaxation. — Counterinduc. The Quinine
counterinduc. applied to the region of the liver
has been found serviceable —
Omit. This I have seen no effect and
without any apparent benefit.

As the cause of biliary calculi depends
as I have endeavored to prove on a torpid
I discussed state of the stomach. It there-
fore follows that the disease can best be
successfully cured only by exciting a new and
healthy action in place of the diseased one
and thus restore the stomach to its former
vigour. With this view a nausea should
be excited and kept up for an hour or
more at a time either with the sulphate
of copper alone or combined with
Opium or tartar emetic. By this means
a new action is kept up and when
purging succeeds the nausea, that loos-
ens the villous coat of the stomach and
excites the action of the gastric liquid
from the force, is brought back with
it and the peristaltic motion is stimu-
lated by its propulsive quality and the

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Stagnant forces discharged. These emollient
ing medicines should be repeated as often
as occasion require - for unless the stomach
shall lose the vitææ assets of weakened
stomach be removed, no medicine you
can give will have the desired effect.
The patient should live on such food
as is easily digested: it should be principally
pully animal food sorted. All kinds of
fats and fat meats should be avoided.
He should eat but little at a time, & be
not to overload his stomach - but he
should eat often. All kinds of acids,
wines, and spirituous liquors should be
abstained from. For breakfast, pour
flavour bread of 24 hours standing with a
pint of new milk and half a pint of
lime water is way of digestion. After
dinner a table spoonful of port should be
taken, a wheat would be much better,
to assist digestion, if it could be procured,
is two tea spoonful of the gastric juice
of an hog mixed with a little milk.
According to Kruze a liquor may be made of
phosphoric acid and Volatili which
proceeds an effect upon adjacent viscera
to the gastric juice. Cocummarate's
pungent paracitizing thing active liquor is.
Dissolve Fresh milk 34 in spring water 34.

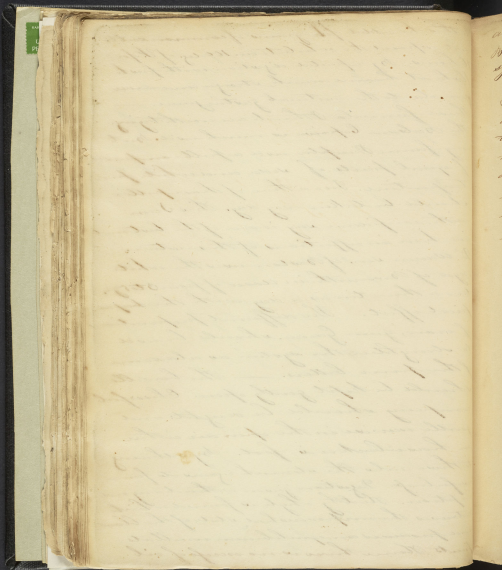
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4. this he added for years of common cold,
and exposed the whole to an 100 deg. of St. for
16 hours. By repeated digestion with fresh
flask it became much stronger and more
similar to the natural gastric juice.

These formula I think are worth trying.
The Balsam Capivi is much used. But

my former Prescriber used a full compound
of equal parts of soda and white ferrous
temperatures. Two or three of these pills
should be taken every day. This I can
with confidence say is one of the best and
we have an affection of this nature.

Dr Warren says of Boston used the white
oxygen of Bicarbonate in doses of from 3 to 5 grs.
two or three times a day with the best
first effect. The different preparations
of iron, from Gassner should be used
to strengthen the system as also some
of the pure bitters. — The bowels
should be kept gently open. Cheerful
company should be sought, and
gentle exercise in the open air either
on horseback or on foot. By adhering
to these rules the stomach regains its former
usefulness. Digestion goes on without any extra
exertion. Healthy chyle is formed which
restores the improved state of the blood
and processes are equilibrium in all its
parts. Hence there is no escape of oil



albumen to form caly conversions
But perfect bile is formed, and the whole
system seems to be regenerated.

I commenced making some experiments
on the blood of the Vena-porta in order
to ascertain whether there is any
material difference between it and the
other venous blood. I have, progress is
sufficiently as yet, to enable me to
lay them before you in this way: but
I shall prosecute them further, and
inform you of the results.

Drumy (Calcutta).

Dear Sir,
I have the honor to acknowledge the receipt
of your letter of the 10th inst. and in reply
to inform you that I have the honor to
acknowledge the receipt of your letter of the 10th inst.

